

QUARTERLY GROUNDWATER MONITORING REPORT

Fourth Quarter 2005 (First Quarterly)
Sampled on December 9, 2005
Job # SP-5
LOP # 12224

March 20, 2006

Reveles Property 1503 South Main Street Fortuna, California 95540

This *Quarterly Groundwater Monitoring Report* was prepared for Anastacio Reveles by SounPacific using data from previous studies that were conducted by SounPacific and a review of relevant files conducted at Humboldt County Division of Environmental Health (HCDEH). The Site is located at 1503 South Main Street, Fortuna, California (Figure 1).

SITE DESCRIPTION

The Reveles Property (the Site) consists of a small, non-residential, single-story building with an office and a shop/garage situated in the center of the property. The area in front of the building is surfaced primarily with gravel, asphalt, and patches of concrete (Figure 2). The Site is serviced by public utilities.

SITE TOPOGRAPHY AND LAND USE

Previous grading in the southeastern portion of the property has resulted in a relatively level site that slopes gently to the west and northwest. The Site is relatively level and regional topography slopes gently to the west and northwest. The Site elevation is approximately 185 feet above mean sea level (Figure 1). The surrounding land use is predominantly residential with some commercial properties and undeveloped areas. Commercial buildings are located northwest of the Site, and some undeveloped areas are located northeast of the Site.

SITE HISTORY

Previous studies overseen by SounPacific indicated the following historical information:

1990 UST Removal (Beacom)

In a letter dated April 24, 1989, HCDEH informed Mr. Reveles that unless his UST was exempt, it must be closed under permit or operated under permit. To comply with this request, Mr. Reveles contracted Beacom Construction of Fortuna, California (Beacom) to remove the entire UST system. The UST system was removed from the Site under permit from the HCDEH in January of 1990. The UST system included two (2) 4,000-gallon unleaded gasoline USTs, one (1) 2,000-gallon waste oil UST, the underground product and vent lines, and the electrical conduit and wiring. At the time of removal, holes were observed in the USTs and a hydrocarbon odor was present in the excavation pit. HCDEH staff collected six (6) soil samples from the ends of the USTs. Out of six (6) samples collected, six (6) samples reported concentrations of BTXE less than 1 ppm. Two (2) groundwater samples were collected from the excavation pits. Laboratory analytical results reported concentrations of BTXE greater than 1,000 ppb in both samples. A summary of the soil and groundwater analytical results are reported in Tables 1 and 2, respectively.

HCDEH staff filed an Unauthorized Release Form with the California Regional Water Quality

Control Board-North Coast Region (NCRWQCB). In a letter dated February 28, 1990, the NCRWQCB requested a hydrogeologic assessment to determine the threat and/or impact to groundwater.

2001 Subsurface Investigation (SounPacific)

On November 12 and 13, 2001, in accordance with the SounPacific March 5, 2001, Subsurface Investigation Work Plan, eight (8) soil borings (B-1 through B-8) were drilled and sampled at the Site (Figure 3). In addition to the eight (8) soil borings, temporary wells were also scheduled to be constructed in each of the boring locations. However, due to consistent drilling refusal prior to reaching groundwater in seven (7) of the eight (8) soil borings, it was only possible to install one (1) temporary well (TW-1) at soil boring location B-5 (Figure 3). This issue was discussed with HCDEH on November 13, 2001, and based on these communications an additional boring was drilled into which an additional temporary well (TW-2) was installed (Figure 3). Twentythree soil samples were collected and analyzed, of which three (3) samples reported concentrations of TPHg. Soil analytical results indicated elevated levels of TPHg (> 50 ppm) adjacent to the USTs and dispenser islands in borings B-3 and B-6 (Table 1). Groundwater samples were collected from both temporary wells, with analytical results reporting TPHg at 33,800 ppb and 18,200 ppb for temporary wells TW-1 and TW-2 respectively. In addition elevated levels of BTXE (> 5,000 ppb), and MTBE (> 100 ppb) were reported in both groundwater samples collected (Table 2). Further investigation was necessary to delineate the groundwater contamination.

HCDEH concurred with SounPacific to prepare a workplan to conduct further subsurface investigation, including installation of monitoring wells, and to conduct a sensitive receptor survey in a letter dated November 5, 2002. HCDEH also indicated, in the same letter, that in order to evaluate the Site's potential for natural attenuation, additional biodegradation indicators would need to be monitored. SounPacific submitted a *Site Characterization Workplan*, dated April 12, 2003, which presented monitored natural attenuation as an interim remedial alternative to monitor the hydrocarbon degradation at the Site. HCDEH did not approve this *Workplan* and

requested SounPacific to develop a site conceptual model and to expand the workplan to investigate the source for the observed contamination in the groundwater. In a letter dated June 15, 2004, HCDEH additionally requested that the revised workplan focus on delineating contamination in soil as well as gathering information regarding the previously identified groundwater plume. SounPacific submitted a *Subsurface Investigation Workplan Addendum*, which included the installation of monitoring wells and initiating a quarterly groundwater monitoring program in January 2005. HCDEH approved the addendum in a letter dated February 24, 2005.

2005 Subsurface Investigation (SounPacific)

On September 6, 2005, SounPacific staff performed a subsurface investigation at the Reveles site to investigate the source of the groundwater contamination and delineate the extent of the soil and groundwater contamination. All investigative work was performed in accordance with the approved SounPacific *Subsurface Investigation Work Plan Addendum (Addendum)*, dated January 20, 2004 and additional modifications approved by HCEDH. The investigation consisted of drilling three (3) onsite soil borings (MW-1, MW-2, and MW-3) for soil classification and both soil and groundwater sample collection (Figure 3). Out of 24 soil samples collected, one (1) sample reported concentrations of TPHd and TPHmo. Select samples were also analyzed for metals; however, all metal levels were within the normal background range. The proposed borings should have been converted into monitoring wells; however, groundwater was only encountered in borehole MW-2, with drilling refusal in the other well borings prior to encountering groundwater. As a result, MW-2 was the only borehole that was converted to a groundwater monitoring well.

Due to the initial problems, on September 7, 2005, three (3) step-out borings (SB-1 through SB-3) were drilled in an additional attempt to investigate the groundwater depth at the Reveles Site (Figure 3). These step-out borings were drilled down to depths of approximately 30 feet bgs. The drillings were discontinued due to drill refusal caused by extremely rocky condition in the subsurface. No groundwater was encountered in any of the step-out borings.

RESULTS OF QUARTERLY SAMPLING

A quarterly groundwater monitoring program was implemented by SounPacific on December 9, 2005, and will continue until further notice. The purpose of the quarterly groundwater monitoring and sampling events are to monitor hydrocarbon concentrations on site, and collecting quarterly water level data to document any changes in groundwater levels. The single monitoring well was gauged and sampled on December 9, 2005.

FIELD DATA

Wells gauged: MW-2

Groundwater: Depth to Groundwater = 4.40 feet

Groundwater Elevation = 182.33 feet above mean sea level

Floating Product: None

On December 9, 2005, the depth to groundwater in the Site's only monitoring well was 4.40 feet below top of casing (btoc). When corrected to mean sea level, the water level elevation was 182.33 feet above mean sea level (amsl) in MW-2. The groundwater level for the December 9, 2005 monitoring event, along with the historical level and elevation is included in Table 3. Prior to sampling, the well was purged; the groundwater field purging parameters are presented below.

MONITORING WELL MW-2 GROUNDWATER FIELD PARAMETERS

Time	Total Vol. Removed/ gal	pН	Temp./ F	Cond./ ms(cm) ⁻¹
10:46 am	0	7.16	58.59	0.121
10:53	1.5	6.99	58.75	0.142
10:58	3.0	7.00	58.84	0.135
11:04	4.5	6.92	59.59	0.127

ANALYTICAL RESULTS

Sampling locations: MW-2

Analyses performed: TPHg, TPHd, TPHmo, VOCs (full list 8260), and CAM-5 metals

Laboratories Used: Basic Labs, Redding, California ELAP #1677

On December 9, 2005, the second monitoring event for the single onsite monitoring well was conducted, with the well being sampled for laboratory analysis. The analytical results for the current monitoring event are presented below and graphically depicted in Figure 4. The laboratory report is included as Appendix A. The historical analytical results for the single monitoring well, is included as Table 4.

	<u>MW-2</u> (ppb)
TPHg:	ND < 50
Benzene:	ND < 0.5
Toluene:	ND < 0.5
Xylenes:	ND < 1.0
Ethylbenzene:	ND < 0.5
MTBE:	ND < 1.0
DIPE:	ND < 0.5
TAME:	ND < 0.5
ETBE:	ND < 0.5
TBA:	ND < 50
TPHd:	ND < 50
TPHmo:	156

COMMENTS AND RECOMMENDATIONS

On December 9, 2005, the 1st groundwater monitoring event, following the initial installation sampling, for the single onsite monitoring well was conducted at the Reveles Property at 1503 South Main Street in Fortuna, California. A summary of the results are presented below.

- The depth to groundwater in the onsite well was 4.40 feet btoc (MW-2). When corrected to sea level, the water level elevation was 182.33 feet above mean sea level (amsl).
- Groundwater samples from the onsite well were collected and analyzed for TPHg, TPHd, TPHmo, full list 8260 VOCs, and CAM-5 metals. No TPHg, BTEX, or fuel oxygenates were reported. TPHmo was reported at a concentration of 156 ppb. Of the VOCs, only Sec-Butylbenzene was reported at a concentration of 0.7 ppb. Chromium, nickel, and zinc were reported at concentrations of 75 ppb, 82 ppb, and 94 ppb, respectively. No other constituents were reported in the well at or above the reporting limits.

Based on the results of the December 2005 monitoring event the following future activities are proposed.

- Groundwater monitoring will be continued until further notice. Groundwater level measurements will be collected from the onsite monitoring well. Groundwater sampling and analysis will be conducted from the onsite well. We propose omitting full list VOCs by 8260 and CAM-5 metals from the sampling suite. Collected groundwater samples from the well will be analyzed for TPHg, BTXE, TPHd, and TPHmo.
- SounPacific is currently preparing a workplan for the installation of two (2) additional
 monitoring wells at the Reveles Property, as approved by HCDEH in the correspondence
 dated February 16, 2006. Following the installation of these wells, they will be
 incorporated into the groundwater monitoring program.

CERTIFICATION

This report was prepared under the direct supervision of a California registered geologist at SounPacific. All information provided in this report including statements, conclusions and recommendations are based solely upon field observations and analyses performed by a state-certified laboratory. SounPacific is not responsible for laboratory errors.

SounPacific promises to perform all its work in a manner that is currently used by members in similar professions working in the same geographic area. SounPacific will do whatever is reasonable to ensure that data collection is accurate. Please note however, that rain, buried utilities, and other factors can influence groundwater depths, directions and other factors beyond what SounPacific could reasonably determine.

No. 07994

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TABLES

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Table 2: Groundwater Analytical Results

Table 3: Water Levels

Table 4: Groundwater Analytical Results from Monitoring Well

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Figure 2: Site Plan

Figure 3: Sample Location Map

Figure 4: Groundwater Analytical Results

APPENDICES

Appendix A: Laboratory Report and Chain-of-Custody Form

Appendix B: Standard Operating Procedures

Appendix C: Field Notes

Tables

Table 1 Soil Analytical Results

Reveles Property 1503 South Main Street Fortuna, California 95540

Sample ID	Sample Location	Sample Date	TPHg (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	MTBE (ppm)	DIPE (ppm)	TAME (ppm)	ETBE (ppm)	TBA (ppm)	DBE (ppm)	DCE (ppm)	TPHC/oil & grease (ppm)	TPHC/ gasoline (ppm)	TPHC/ diesel (ppm)
#1 East	Waste Oil UST Pit	1/10/1990		ND < 0.050	0.060	ND < 0.050	ND < 0.05								ND < 250	ND < 1	ND < 1
#1 West	Waste Oil UST Pit	1/10/1990		ND < 0.050	0.070	ND < 0.050	ND < 0.05								ND < 250	ND < 1	ND < 1
#2 South	Gas UST Pit	1/10/1990		ND < 0.050	0.14	ND < 0.050	0.060									ND < 1	
#2 North	Gas UST Pit	1/10/1990		ND < 0.050	0.25	ND < 0.050	0.080									ND < 1	
#3 South	Gas UST Pit	1/10/1990		ND < 0.050	0.16	ND < 0.050	0.070									ND < 1	
#3 North	Gas UST Pit	1/10/1990		ND < 0.050	0.14	ND < 0.050	0.080									ND < 1	
SP-5 B-1 @ 5'	B-1	11/12/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-1 @ 10'	B-1	11/12/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-1 @ 15'	B-1	11/12/2001	ND < 0.060	ND < 0.005	ND < 0.005		ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-2 @ 5'	B-2	11/12/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-2 @ 10'	B-2			ND < 0.005					ND < 0.005								
SP-5 B-2 @ 15'	B-2			ND < 0.005					ND < 0.005								
SP-5 B-3 @ 5'	B-3	11/12/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-3 @ 10'	B-3	11/12/2001	56.3	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-3 @ 15'	B-3			ND < 0.005					ND < 0.005								
SP-5 B-4 @ 5'	B-4	11/13/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-4 @ 10'	B-4	11/13/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-5 @ 5'	B-5	11/13/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-5 @ 10'	B-5			ND < 0.005			ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-5 @ 15'	B-5			ND < 0.005					ND < 0.005								
SP-5 B-6 @ 5'	B-6	11/12/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-6 @ 10'	B-6	11/12/2001	103	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-6 @ 15'	B-6	11/12/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-7 @ 5'	B-7	11/13/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-7 @ 10'	B-7	11/13/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-7 @ 10' L	B-7	11/13/2001	0.505	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-7 @ 15'	B-7	11/13/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			
SP-5 B-8 @ 5'	B-8			ND < 0.005					ND < 0.005								
SP-5 B-8 @ 10'	B-8	11/13/2001	ND < 0.060	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.015	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005	ND < 0.005			

Table 1 (cont.) Soil Analytical Results

Reveles Property 1503 South Main Street Fortuna, California 95540

Sample ID	Sample Location	Sample Date	TPHg (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	MTBE (ppm)	DIPE (ppm)	TAME (ppm)	ETBE (ppm)	TBA (ppm)	TPHd (ppm)	TPHmo (ppm)	Cadmium (ppm)	Chromium (ppm)	Lead (ppm)	Nickel (ppm)	Zinc (ppm)
MW-1 @ 4'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	61	ND < 10	71	56
MW-1 @ 8'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	68	ND < 10	60	50
MW-1 @ 12'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	51	ND < 10	69	53
MW-1 @ 16'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	41	ND < 10	60	47
MW-1 @ 19'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	67	ND < 10	68	56
MW-1 @ 23'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	68	ND < 10	69	53
MW-1 @ 25'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	60	11	75	67
MW-1 @ 30'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	76	ND < 10	91	56
MW-1 @ 36'	MW-1	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	62	ND < 10	72	63
MW-2 @ 4'	MW-2	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	54	ND < 10	36	45
MW-2 @ 7'	MW-2	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	50	ND < 10	43	43
MW-2 @ 11'	MW-2	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	41	ND < 10	62	50
MW-2 @ 15'	MW-2	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	75	ND < 10	71	53
MW-2 @ 19'	MW-2	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	55	ND < 10	68	58
MW-2 @ 24'	MW-2	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	48	ND < 10	65	57
MW-2 @ 28'	MW-2	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	53	ND < 10	64	62
MW-3 @ 4'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	59	12	60	56
MW-3 @ 8'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	1.6	16	ND < 2.0	54	ND < 10	60	55
MW-3 @ 12'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	58	ND < 10	74	56
MW-3 @ 16'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	65	ND < 10	75	60
MW-3 @ 20'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	63	ND < 10	70	58
MW-3 @ 24'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	62	ND < 10	61	52
MW-3 @ 28'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	54	10	69	56
MW-3 @ 35'	MW-3	9/6/2005	ND < 1.0	ND < 0.0050	ND < 0.0050	ND < 0.0050	ND < 0.0150	ND < 0.025	ND < 0.020	ND < 0.020	ND < 0.020	ND < 0.50	ND < 1.0	ND < 10	ND < 2.0	51	ND < 10	76	59

Notes:

TPHg: Total petroleum hydrocarbons as gasoli DBE: 1,2-Dibromoethane
MTBE: Methyl tertiary butyl ether
DCE: 1,2-Dichloroethane
DIPE: Diisopropyl Ether
TBA: Tertiary butanol

TAME: Tertiary amyl methyl ether TPHC:Total Petroleum Hydrocarbons

ETBE: Ethyl tertiary butyl ether ppm: parts per million = μ g/g = mg/kg = 1000 μ g/kg

TPHd: Total petroleum hydrocarbons as diesel ND: Not detected: Sample was detected at or below the method detection limit as shown.

TPHmo: Total petroleum hydrocarbon as motor oil

Table 2

Groundwater Analytical Results

Reveles Property 1503 South Main Street Fortuna, California 95540

Sample ID	Sample Location	Sample Date	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)	MTBE (ppb)	DIPE (ppb)	TAME (ppb)	ETBE (ppb)	TBA (ppb)	DBE (ppb)	DCE (ppb)	TPHC/ Gas (ppb)	TPHC/ Gas (IR) (ppb)	TPHd (ppb)	TPHmo (ppb)	Cd (ppb)	Ch (ppb)	Pb (ppb)	Ni (ppb)	Zn (ppb)
#1 Water	Waste Oil UST Pit	1/10/1990		490	970	ND < 100	570									ND < 1							
#2,3 Water	Gas UST Pit	1/10/1990		320	640	240	820								20,000								
TempW-1	TW-1	12/13/2001	33,800	638	4,700	899	5,660	301	ND < 50	162	ND < 10,000	ND < 100	ND < 50	ND < 50									
TempW-2	TW-2	12/13/2001	18,200	182	2,800	239	2,060	122	ND < 0.5	46.8	ND < 0.5	ND < 100	4.6	ND < 0.5									

Notes:

TPHmo: Total petroleum hydrocarbon as motor oil TPHg: Total petroleum hydrocarbons as gasoline.

MTBE: Methyl tertiary butyl ether DBE: 1,2-Dibromoethane DIPE: Diisopropyl ether DCE: 1,2-Dichloroethane TAME: Tertiary amyl methyl ether TBA: Tertiary butanol

ETBE: Ethyl tertiary butyl ether
TPHC: Total petroleum hydrocarbons. ppb: parts per billion = μ g/l = .001 mg/l = 0.001 ppm. ND: Not detected at or below the method detection limit as shown.

TPHd: Total petroleum hydrocarbon as diesel IR: Infrared

Table 3 Water Levels

Reveles Property 1503 South Main Street Fortuna, California 95540

Sample Location	Date	Depth to Bottom/ Feet BGS	Survey Height/ Feet Above MSL	Depth to Water/ Feet BGS	Adjusted Elevation/ Feet Above MSL
MW-2	9/6/2005	13.46	186.73	6.60	180.13
IVI VV - 2	12/9/2005	12.11	186.73	4.40	182.33

Table 4

Groundwater Analytical Results from Monitoring Wells

Reveles Property 1503 South Main Street Fortuna, California 95540

Sample Location	Sampling Event	Annual Quarter	Sample Date	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)	Ethylbenzene (ppb)	MTBE (ppb)	DIPE (ppb)	TAME (ppb)	ETBE (ppb)	TBA (ppb)	TPHd (ppb)	TPHmo (ppb)	Cd (ppb)	Cr (ppb)	Pb (ppb)	Ni (ppb)	Zn (ppb)
MW-3	Well Installation	3rd Quarter	9/6/2005	ND < 50	ND < 0.5	ND < 0.5	ND < 0.5	ND < 0.5	ND < 1.0	ND < 1.0	ND < 1.0	ND < 1.0	ND < 10	54	ND < 170	ND < 10	300	36	390	400
IVI VV - 5	First Quarterly	4th Quarter	12/9/2005	ND < 50	ND < 0.3	ND < 0.3	ND < 0.6	ND < 0.3	ND < 1.0	ND < 0.5	ND < 1.0	ND < 5.0	ND < 100	ND < 50	156	ND < 5.0	75	ND < 15	82	94

notes:

TPHg: Total petroleum hydrocarbons as gasoline

MTBE: Methyl tertiary butyl ether DIPE: Diisopropyl Ether TAME: Tertiary amyl methyl ether TBA: Tertiary butanol

ETBE: Ethyl tertiary butyl ether

ppb: parts per billion = μ g/l = .001 mg/l = 0.001 ppm.

ND: Not detected. Sample was detected at or below the method detection limit as shown.

Zn: Zinc

Cd: Cadmium Cr: Chromium Pb: Lead

Ni: Nickel

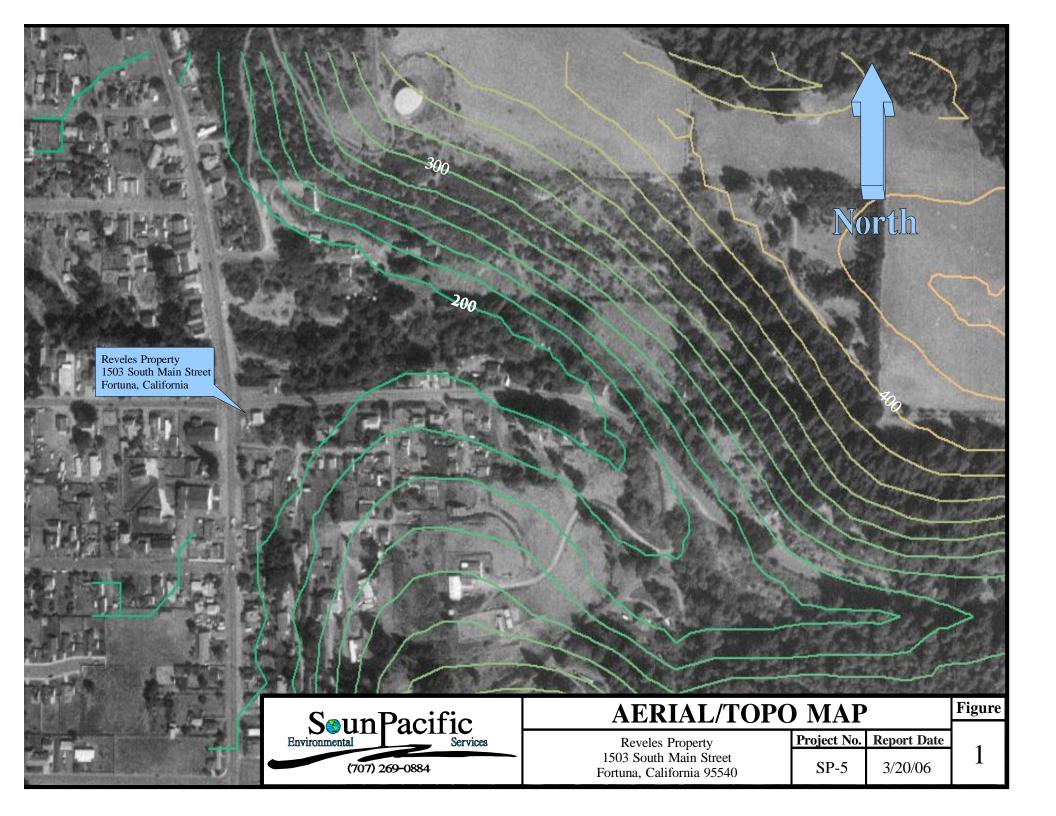
Table 4 (cont.)

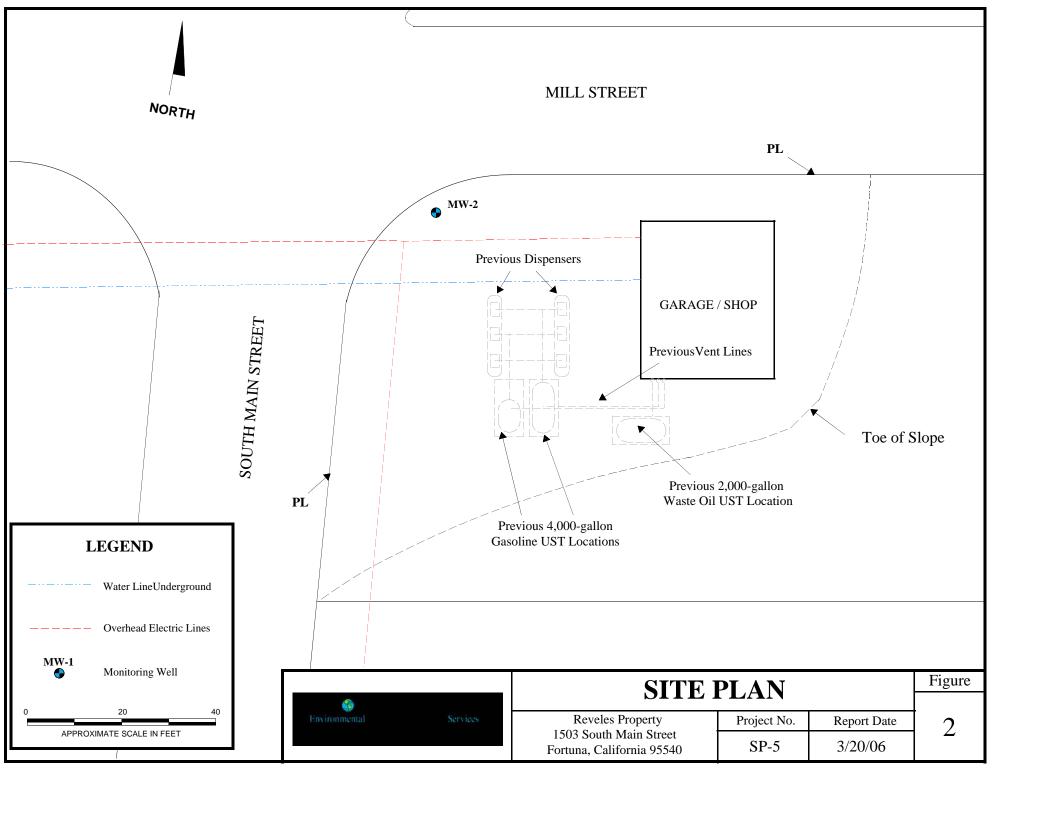
Groundwater Analytical Results from Monitoring Wells

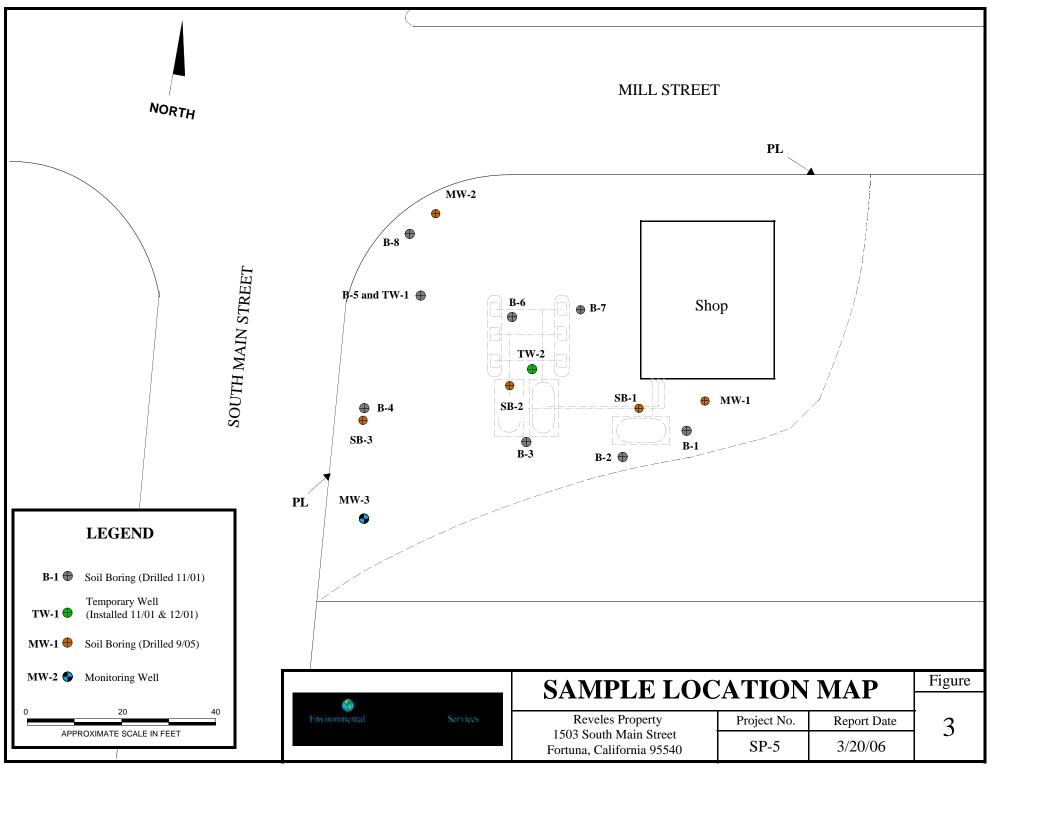
Reveles Property 1503 South Main Street Fortuna, California 95540

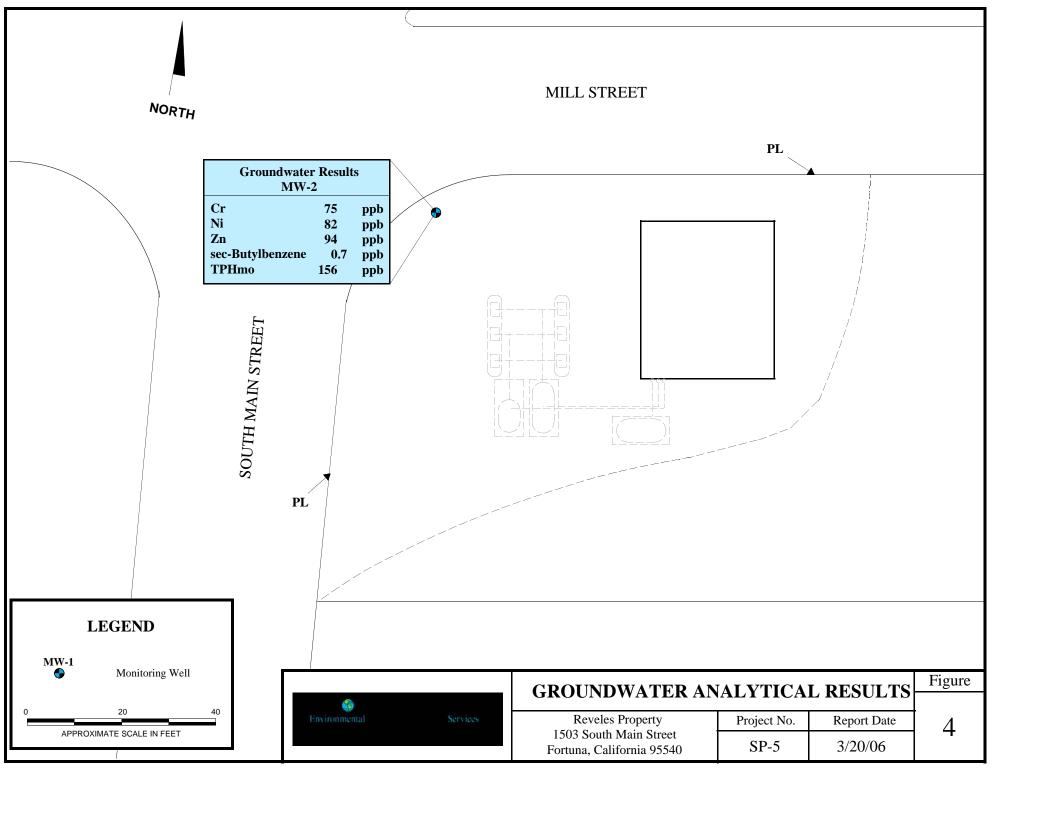
Sample ID	MW-2	Sample ID	MW-2
Sample Date	12/9/2005	Sample Date	12/9/2005
Sample Analysis	Volatile Organic Compounds EPA 8260	Sample Analysis	Volatile Organic Compounds EPA 8260
ANALYTE	Results/ppb	ANALYTE	Results/ppb
Acetone	ND < 5.0	trans -1,2-Dichloroethene	ND < 0.5
Acrylonitrile	ND < 5.0	Dichloromethane	ND < 2.0
Bromobenzene	ND < 0.5	1,2-Dichloropropane	ND < 0.5
Bromochloromethane	ND < 0.5	1,3-Dichloropropane	ND < 0.5
Bromodichloromethane	ND < 0.5	2,2-Dichloropropane	ND < 0.5
Bromoform	ND < 0.5	1,1-Dichloropropene	ND < 0.5
Bromomethane	ND < 1.0	cis -1,3-Dichloropropene	ND < 0.5
2-Butanone	ND < 0.5	trans -1,3-Dichloropropene	ND < 0.5
<i>n-</i> Butylbenzene	ND < 0.5	1,4-Dioxane	ND < 25.0
sec-Butylbenzene	0.7	Hexachlorobutadiene	ND < 0.5
tert-Butylbenzene	ND < 0.5	2-Hexanone	ND < 5.0
Carbon disulfide	ND < 0.5	<i>Isopropyl</i> benzene	ND < 0.5
Carbon Tetrachloride	ND < 0.5	4-Methyl-2-pentanone	ND < 5.0
Chlorobenzene	ND < 0.5	Naphthalene	ND < 0.5
Chloroethane	ND < 0.5	n-Propylbenzene	ND < 0.5
2-Chloroethylvinyl ether	ND < 1.0	Styrene	ND < 0.5
Chloroform	ND < 0.5	1,1,1,2-Tetrachloroethane	ND < 0.5
Chloromethane	ND < 0.5	1,1,2,2-Tetrachloroethane	ND < 0.5
2-Chlorotoluene	ND < 0.5	Tetrachloroethene	ND < 0.5
4-Chlorotoluene	ND < 0.5	Tetrahydrofuran	ND < 1.0
Dibromochloromethane	ND < 0.5	1,2,3-Trichlorobenzene	ND < 0.5
1,2-Dibromo-3-chloropropane	ND < 0.5	1,2,4-Trichlorobenzene	ND < 0.5
1,2-Dibromoethane	ND < 0.5	1,1,1-Trichloroethane	ND < 0.5
Dibromomethane	ND < 0.5	1,1,2-Trichloroethane	ND < 0.5
1,2-Dichlorobenzene	ND < 0.5	Trichloroethene	ND < 0.5
1,3-Dichlorobenzene	ND < 0.5	Trichlorotrifluoroethane	ND < 2.0
1,4-Dichlorobenzene	ND < 0.5	Trichlorofluoromethane	ND < 0.5
Dichlorodifluoromethane	ND < 0.5	1,2,3-Trichloropropane	ND < 0.5
1,1-Dichloroethane	ND < 0.5	1,2,4-Trimethylbenzene	ND < 0.5
1,2-Dichloroethane	ND < 0.5	1,3,5-Trimethylbenzene	ND < 0.5
1,1-Dichloroethene	ND < 0.5	Vinyl acetate	ND < 0.5
cis -1,2-Dichloroethene	ND < 0.5	Vinyl chloride	ND < 0.5

Figures









Appendices

Appendix A



fax 530.243.7494

voice 530.243.7234 2218 Railroad Avenue Redding, California 96001

December 30, 2005

Lab ID: 5120503

Andy Malone **SOUNPACIFIC** 4612 GREENWOOD HEIGHTS DR KNEELAND, CA 95549 RE: REVELES SP-5

Dear Andy Malone,

Enclosed are the analysis results for Work Order number 5120503. All analysis were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

Ricky D. Jensen

Laboratory Director

California ELAP Certification Number 1677



voice **530.243.7234** fax **530.243.7494**

2218 Railroad Avenue Redding, California 96001

Report To: SOUNPACIFIC

4612 GREENWOOD HEIGHTS DR

KNEELAND, CA 95549

Attention: Andy Malone

Project: REVELES SP-5

Description: MW-2

Matrix:

MW-2

Water

Lab No: Reported:

5120503 12/30/05

. Phone:

707-269-0884

P.O. #

707

Sampled: 12/09/05 00:00

Received: 12/15/05 14:25

Metals - Total

<u>Analyte</u>	<u>Units</u>	Results	Qualifier	<u>MDL</u>	<u>RL</u>	<u>Method</u>	Analyzed	<u>Prepared</u>	Batch
Cadmium	ug/l	ND			5.0	EPA 6010A	12/23/05	12/22/05	B5L0491
Chromium	n	75			5	**	"	17	11
Lead	"	ND			15	п	"	11	11
Nickel	"	82			10	n	"	11	11
Zinc	Ħ	94	QR-04		10	eı		11	11

Lab ID: 5120503-01

Volatile Organic Compounds

Acetone ug/l ND 5.0 EPA 8260 12/16/05 12/16/05 B5U0472 Acrylonitrile "ND 5.0 """"""""""""""""""""""""""""""""""""	<u>Analyte</u>	<u>Units</u>	<u>Results</u>	Qualifier	<u>MDL</u>	<u>RL</u>	<u>Method</u>		Prepared	<u>Batch</u>
ND	Acetone	ug/l					EPA 8260	12/16/05	12/16/05	B5L0472
Benzene ND	Acrylonitrile	n					11	" .		n
Bromochoremethane ND	Benzene	n	ND							11
Bromodichloromethane ND 0.5 """"""""""""""""""""""""""""""""""""	Bromobenzene	n	ND					"	11	17
Bromofich ND	Bromochloromethane	n								
Bromoform ND	Bromodichloromethane	п	ND						u u	n
Seromonethane	Bromoform	"					"			**
2-Butanone	Bromomethane	"					"		* 1212 W	**
ND 0.5	2-Butanone	==						"		
Sec-Butylbenzene	n-Butylbenzene					0.5	**	"	"	
Carbon disulfide	sec-Butylbenzene	n							"	
Carbon idsulfide Carbon tetrachloride Carbon tetrachloride Chlorobenzene Chlorobenzene Chloroethane PC-Chloroethylinyl ether Chloroform Chloroform Chloroformethane ND	tert-Butylbenzene	n						•••	*	
Carbon tetrachloride Chlorobenzene Chloroethane Chloroethane 1 ND 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Carbon disulfide	11	ND							**
Chloroethane Chloroethylvinyl ether Chloroethylvinyl ether Chloroethylvinyl ether Chloromethane Chloromethane ND	Carbon tetrachloride	11	ND						"	"
Chloroethane	Chlorobenzene	"	ND						"	W
2-Chloroethylvinyl ether Chloroform Chloromethane ND	Chloroethane	17	ND			0.5		***	"	**
Chloroform Chloromethane Chlorotoluene Chlorotoluene ND Chloromethane ND Chlorotoluene ND C	2-Chloroethylvinyl ether	"	ND				=	•••	*1	
Chlorotoluene 2-Chlorotoluene ND	Chloroform	11	ND						"	
2-Chlorotoluene 4-Chlorotoluene ND	Chloromethane	U	ND			0.5			"	
4-Chlorotoluene Dibromochloromethane 1,2-Dibromo-3-chloropropane (DBCP) 1,2-Dibromoethane (EDB) ND ND 0.5 1,2-Dibromomethane ND ND ND 0.5 """" """ """ 1,2-Dichlorobenzene ND 1,2-Dichlorobenzene ND 0.5 """ """ """ """ """ """ """ """ """ "	2-Chlorotoluene	"	ND						11	"
Dibromochloromethane IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	4-Chlorotoluene		ND			0.5	H		"	
1,2-Dibromo-3-chloropropane (DBCP) "ND 0.5 1,2-Dibromoethane (EDB) "ND 0.5 Dibromomethane "ND 0.5 1,2-Dichlorobenzene "ND 0.5 1,3-Dichlorobenzene "ND 0.5 1,4-Dichlorobenzene "ND 0.5 Dichlorodifluoromethane "ND 0.5 1,1-Dichloroethane "ND 0.5	Dibromochloromethane	"	ND						11	**
1,2-Dibromoethane (EDB) "ND 0.5 """"""""""""""""""""""""""""""""""""	1,2-Dibromo-3-chloropropane (DBCP)	U	ND						n Table 1	
Dibromomethane ND 0.5 """"""""""""""""""""""""""""""""""""		u	ND			0.5	**		. 11	
1,2-Dichlorobenzene "ND 0.5 """"""""""""""""""""""""""""""""""""	Dibromomethane	n	ND						11	
1,3-Dichlorobenzene "ND 0.5 """"""""""""""""""""""""""""""""""""	1,2-Dichlorobenzene	н	ND						P .	"
1,4-Dichlorobenzene "ND 0.5 """"""""""""""""""""""""""""""""""""		n	ND			0.5	11	n ·	n	"
Dichlorodifluoromethane "ND 0.5 """ 1,1-Dichloroethane "ND 0.5 """" """ 1,1-Dichloroethane "ND 0.5 """ 1,1-Dichloroethane "ND 0.5 """ """ """ """ """ """ """ ""	1,4-Dichlorobenzene	п	ND			0.5			"	"
1,1-Dichloroethane "ND 0.5	Dichlorodifluoromethane	"	ND			0.5	10			"
	1,1-Dichloroethane	"	ND			0.5	10		n	"
1,2-Dichloroethane "ND U.5		"	ND			0.5	17	"	. "	"
1,1-Dichloroethene "ND 0.5 """""	1,1-Dichloroethene	"	ND			0.5	11			"
cis-1,2-Dichloroethene "ND 0.5 """""		n	ND			0.5	19			
trans-1,2-Dichloroethene "ND 0.5 """""		n	ND						**	n
Dichloromethane "ND 2.0 """""		n	ND				-		==	"
1,2-Dichloropropane "ND 0.5 """"	1,2-Dichloropropane	n	ND			0.5				
1,3-Dichloropropane "ND 0.5 """		II	ND			0.5	11	" .	"	**

Approved By

Basic Laboratory, Inc. California D.O.H.S. Cert #1677



fax 530.243.7494

voice 530.243.7234 2218 Railroad Avenue Redding, California 96001

Report To: SOUNPACIFIC

4612 GREENWOOD HEIGHTS DR

KNEELAND, CA 95549

Attention: Andy Malone

Project: **REVELES SP-5**

Water

Description: MW-2

Matrix:

Lab ID: 5120503-01

Reported:

Lab No: 5120503 12/30/05

Phone:

707-269-0884

P.O. #

Sampled: 12/09/05 00:00

Received: 12/15/05 14:25

Volatile Organic Compounds

<u>Analyte</u>	<u>Units</u>	<u>Results</u>	Qualifier	MDL	<u>RL</u>	<u>Method</u>	Analyzed	Prepared	Batch
2,2-Dichloropropane		ND ND	<u> </u>		0.5	n	11	12/16/05	ü
1,1-Dichloropropene	11	ND			0.5	11	n	'n	Ħ
cis-1,3-Dichloropropene	**	ND			0.5	11	n n	n	н
trans-1,3-Dichloropropene	n	ND			0.5	19	11	н	n
1,4-Dioxane	"	ND			25.0	11	U	н	н
Ethylbenzene	U	ND			0.5	11	11	n	
Ethyl tert-butyl ether		ND			0.5	10	II	11	н
Hexachlorobutadiene	II	ND			0.5	11	II .	11	"
2-Hexanone	II	ND			5.0	11	11	10	11
Isopropylbenzene	11	ND			0.5	n n	11	11	11
Di-isopropyl ether	11	ND			0.5	H.	11	11	51
p-Isopropyltoluene	n	ND			0.5	n	11	"	11
4-Methyl-2-pentanone	n	ND			5.0	н	"	n	н
Methyl tert-butyl ether	n	ND			1.0	и	n	n	n
Naphthalene	n	ND			0.5	11	11	tt	н
n-Propylbenzene	"	ND			0.5	п	11	n	n
Styrene	II.	ND			0.5	11	н	н	н
Tert-amyl methyl ether	ii.	ND			0.5	II	n	u	U
1,1,1,2-Tetrachloroethane	II .	ND			0.5	11	11	11	11
1,1,2,2-Tetrachloroethane	11	ND			0.5		11	11	10
Tetrachloroethene	n	ND			0.5	11	11	"	H.
Tetrahydrofuran	U	ND			5.0	"	11	"	II .
Tert-butyl alcohol	II .	ND			50.0	н	11	n .	u
Toluene	II .	ND			0.5	n	11	n	п
1,2,3-Trichlorobenzene	ır	ND			0.5	н	11	н	n
1,2,4-Trichlorobenzene	tr	ND			0.5	н	*1	n	ti
1,1,1-Trichloroethane	11	ND			0.5	n	11	n	**
1,1,2-Trichloroethane	ŧ	ND			0.5	n	II .	n	n
Trichloroethene	ti	ND			0.5	n	11	n	H
Trichlorotrifluoroethane	H	ND			2.0	11	н	n	ŧı
Trichlorofluoromethane	Ħ	ND			0.5	11	n	n	**
1,2,3-Trichloropropane	ır	ND			0.5	11	н	19	11
1,2,4-Trimethylbenzene	II	ND			0.5	v	n	11	11
1,3,5-Trimethylbenzene	11	ND			0.5	u u	H	11	11
Vinyl acetate	11	ND			0.5	o o	n	10	10
Vinyl chloride	11	ND			0.5	"	II.	11	•
m,p-Xylene	n	ND			1.0	II .	II .	tr	"
o-Xylene	n n	ND			0.5		11	**	"
Xylenes (total)	n	ND			1.5	н	11	н	II .
Surrogate: 1,2-Dichloroethane-d4		109 %		<i>28-1</i>	145	"	"	"	"
Surrogate: Toluene-d8		99.0 %		52-2		"	"	"	"
Surrogate: 4-Bromofluorobenzene		115 %		<i>43-</i> 2		"	"	n	"

Basic Laboratory, Inc.

California D.O.H.S. Cert #1677



voice **530.243.7234**

2218 Railroad Avenue fax 530.243.7494 Redding, California 96001

Report To: **SOUNPACIFIC**

4612 GREENWOOD HEIGHTS DR

KNEELAND, CA 95549

Attention: Andy Malone

Project: REVELES SP-5

Description:

MW-2

Matrix: Water

Lab ID: 5120503-01

Lab No: Reported:

5120503 12/30/05

707-269-0884

Phone:

P.O. #

Sampled: 12/09/05 00:00

Received: 12/15/05 14:25

TPH Gasoline Range Organics

<u>Analyte</u>	<u>Units</u>	<u>Results</u>	Qualifier	<u>MDL</u>	<u>RL</u>	<u>Method</u>	Analyzed	<u>Prepared</u>	Batch
Gasoline	ug/l	ND			50.0	EPA 8015/8260	12/16/05	12/16/05	B5L0472
Surrogate: 4-Bromofluorobenzene		115 %		<i>43-1</i>	155	"	"	"	"

TPH Diesel & Motor Oil

<u>Analyte</u>	<u>Units</u>	Results	Qualifier	<u>MDL</u>	<u>RL</u>	<u>Method</u>	Analyzed	<u>Prepared</u>	<u>Batch</u>
Diesel	ug/l	ND	O-05		50	EPA 8015 MOD	12/21/05	12/16/05	B5L0362
Motor Oil	"	156	O-05		50	11	II .	"	11
Surrogate: Octacosane		94.9 %	O-05	50-1	50	"	"	"	"

	Notes and Definitions
	Notes and Deminions
QR-04	Duplicate results are within one reporting limit and pass all necessary QC criteria.

0-05 This sample was extracted outside of the EPA recommended holding time.

Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). The J flag is

equivalent to the DNQ Estimated Concentration flag.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the detection limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference < Less than reporting limit

Less than or equal to reporting limit ≤

Greater than reporting limit

Greater than or equal to reporting limit

MDL Method Detection Limit

RL/ML Minimum Level of Quantitation

MCL/AL Maxium Contaminant Level/Action Level

Results reported as wet weight mg/kg TTLC **Total Threshold Limit Concentration** STLC Soluble Threshold Limit Concentration TCLP Toxicity Characteristic Leachate Procedure

Basic Laboratory, Inc. California D.O.H.S. Cert #1677

Page 4 of 4

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INSTRUCTION	NS, TERMS	AND	CON	NDIT	IONS ON BACK			-											

Appendix B



Standard Operating Procedures

Groundwater Level Measurements and Free Phase Hydrocarbon Measurements

All SounPacific staff and contractors shall adopt the following procedures any time that groundwater elevations are determined for the purposes of establishing groundwater gradient and direction, and prior to any sampling event.

Wells are to be tested for free phase hydrocarbons (free product) before the first development or sampling of any new well, and in any well that has historically contained free product.

Equipment Checklist

ш	Combination water level / free phase hydrocarbon indicator probe (probe)
	Gauging Data / Purge Calculations Sheet
	Pencil or Pen/sharpie
	Disposable Gloves
	Distilled Water and or know water source on site that is clean
	Alconox (powder) or Liquinox (liquid) non-phosphate cleaners—do not use soap!
	Buckets or Tubs for decontamination station
	Tools necessary to access wells
	Site Safety Plan
	This Standard Operating Procedure
	Notify Job site business that you will be arriving to conduct work.

Procedure

- 1. Review Site Safety Plan and utilize personal protection appropriate for the contaminants that may be encountered.
- 2. Access and open all monitoring wells to be measured. Allow wells to equilibrate for approximately 15 minutes before taking any measurements.

Standard Operating Procedure for Groundwater Level and Free Product Measurements Page 2 of 2

- 3. Decontaminate probe with Alconox or Liquinox solution, and rinse with distilled water.
- 4. Determine the diameter of the well to be measured and indicate this on the Gauging Data / Purge Calculations Sheet.
- 5. <u>Words of caution:</u> Please be careful with water level and product meters probes are not attached with high strength material so please make sure to avoid catching the end on anything in the well and make sure not to wind reel to the point that it could pull on the probe. *If product is suspect in a well, go to step 6, if no product is suspected go to step 7 below.*
- 6. When product is present or suspected: use the product level meter. Clip the static charge clamp to the side of the well casing. Then lower probe into the well through the product/water interface about one foot if possible. Then slowly raise the probe back up through the product/water interface layer and record the level as the tone changes from solid to broken-record this level in the Gauging Data / Purge Calculations Sheet to the nearest 0.01 foot (DTP). Continue to raise the probe up through the product until the tone stops completely-record this level on the Gauging Data / Purge Calculations Sheet to the nearest 0.01 foot (DTW). Then go to step 8.
- 7. When <u>no</u> product is present or suspected: If no free product is present, record the depth of the water (to the nearest 0.01 foot) relative to the painted black mark on the top of the well casing. Leave the probe in the well just a hair above the water level to ensure the well as equilibrated. As the well rises, the tone will sound. Make sure no increase in water levels have occurred in over a ten-minute period. Water levels can lower as well as rise. Make sure you note when the level you keep lowering the probe to has remained stable for at least ten minutes. Once this has been accomplished, please record this level in the Gauging Data / Purge Calculations Sheet to the nearest 0.01 foot (DTW).
- 8. Turn off the probe, and use the probe to determine the depth to the bottom of the well relative to the top of the well casing. This is the depth to bottom measurement (DTB).
- 9. Decontaminate probe and tape by washing in an Alconox/Liquinox solution (*read directions on solution for ratio of water to cleanser*) and use the toothbrush provided to remove any foreign substance from the probe and tape. Then triple rinse probe and tape with clean water and then proceed to take measurements in the next well.
- 10. If sampling is to occur, proceed to implement SounPacific's Standard Operating Procedure for Monitoring Well Purging and Sampling. If no sampling is to be performed, close and secure all wells and caps.



Standard Operating Procedures

Monitoring Well Purging and Groundwater Sampling

All SounPacific employees and contractors shall adopt the following procedures any time that groundwater samples are to be taken from an existing groundwater monitoring well.

Prior to the implementation of these procedures, the groundwater level **MUST** be measured and the presence of free phase hydrocarbons determined in accordance with SounPacific's Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements.

Equipment Checklist

Gauging Data / Purge Calculations Sheet used for water level determination
Chain of Custody Form
pH/ Conductivity / Temperature meter
Pencil or Pen
Indelible Marker
Calculator
Disposable Gloves
Distilled Water
Alconox/liquinox liquid or powdered non-phosphate cleaner
Buckets or Tubs for decontamination station
Bottom-filling bailer or pumping device for purging
Disposable bottom-filling bailer and emptying device for sampling
String, twine or fishing line for bailers
Sample containers appropriate for intended analytical method (check with lab)
Sample labels
Site Safety Plan
Tools necessary to access wells
Drum space on site adequate for sampling event

SounPacific Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements, Page 2 of 3

Procedure

- 1. Review Site Safety Plan and utilize personal protection appropriate for the contaminants that may be encountered.
- 2. Measure groundwater levels and check for the presence of free product in accordance with the Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements.

Purging

- 3. Calculate and record the volume of standing water in each well using the information provided on the Gauging Data / Purge Calculations sheet.

 (DTB-DTW) x Conversion Factor = Casing Volume.
- 4. The purge volume shall be at least three times and no more than seven times the volume of standing water (the casing volume).
- 5. Purge the well by bailing or pumping water from the well into a calibrated receptacle, such as a five gallon bucket or tub with markings to indicate one gallon increments. Collect purgeate in a 55 gallon labeled drum and store on site. Drum labels should include the date, contents, site number, and SounPacific's name and telephone number.
- 6. Take measurements of pH, conductivity, temperature, and visual observations to verify the stabilization of these parameters. At least five measurements of these parameters should be made throughout the purging process. The parameters shall be considered stabilized if successive measurements vary by less than 0.25 pH units, 10% of conductivity in μS, and 1°C (or 1.8°F). Continue purging until at least three times the casing volume has been removed, and the measured parameters have stabilized as indicated above. Do not exceed seven casing volumes.
- 7. Take a final depth to groundwater measurement and calculate the casing volume of the recharged well. Ideally, the casing volume should have recharged to at least 80% of the original measured casing volume before sampling commences. If due to slow recharge rates it is not feasible to wait for the well to fully recharge, then note this on the Gauging Data / Purge Calculation Sheet and proceed to sample following the procedure below.

SounPacific Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements, Page 3 of 3

Sampling

- 8. After completing groundwater measurement, and checking for free product if necessary, in accordance with SounPacific's Standard Operating Procedures for Groundwater Level Measurements and Free Phase Hydrocarbon Measurements, and after purging monitoring wells as described above, groundwater samples may be collected.
- 9. Slowly lower a clean, previously unused disposable bailer into the well water approximately half of the bailer length, and allow the bailer to slowly fill.
- 10. Withdraw the full bailer from the monitoring well and utilize the included (clean and unused) bottom-emptying device to fill the necessary sample containers, and seal the container with the included PTFE (Teflon) lined cap.
- 11. When filling VOAs, fill the VOA completely full, with the meniscus rising above the rim of the bottle. Carefully cap the VOA and invert it and gently tap it to determine whether air bubbles are trapped inside. If the VOA contains air bubbles, refill the VOA and repeat this step.
- 12. All samples shall be labeled with the Sample ID, the Sample Date, and the Sample Location or Project Number. Use an indelible marker for writing on sample labels.
- 13. Record all pertinent sample data on the Chain of Custody.
- 14. Place samples in an ice chest cooled to 4°C with ice or "blue ice". Bottles should be wrapped in bubble wrap, and VOA's should be inserted in a foam VOA holder to protect against breakage. Samples are to be kept at 4°C until delivered to the laboratory. Any transference of sample custody shall be indicated on the Chain of Custody with the appropriate signatures as necessary.
- 15. Utilize clean, previously unused gloves, bailer and line, and bottom-emptying device for each well sampled.
- 16. When finished with all sampling, close and secure all monitoring wells.
- 17. Leave the site cleaner than when you arrived and drive safely.

Appendix C

GAUGING DATA/PURGE CALCULATIONS

Job Site:	Re	veles				Job No.:	SP	-5	— SounPac	SounPacific			
Event:	1st (Quarte	rly	Fourth	Quelo	Date:	12/	9/0	SounPac (707) 269-0884	Service			
WELL NO.	DIA (in.)	DTB (ft.)	DTW (ft.)	ST (fL)	CV (gal.)	PV (gal.)	SPL (fL)	Bailer Loads	Notes				
MW-2	2	12.11	4.40	7.71	1.25	3.75	_	-	No sheen				

Explanation:

DIA. = Well Diameter

DTB = Depth to Bottom

DTW = Depth to Water ST = Saturated Thickness (DTB-DTW)

CV = Casing Volume (ST x cf)

PV = Purge Volume (standard 3 x CV,

well development 10 x CV) SPL = Thickness of Separate Phase Liquid

Conversion Factors (cf):

2 in. dia. well of = 0.16 gal./ft.

4 in. dia. well of = 0.65 gal./ft.

6 in. dia. well of = 1.44 gal./ft.

Sampler:

Jest Ceaines



Well Gauging/Sampling Report

Date: 12/9/05 Project Name: Reveles Project No. SP-5 Well Number: MW-2

nalyses TPHs, BTXE, 5 OXy's, TPHd/no, CAM 5, Halongers

Sample (3) HCl VOA's, (2) 1-L Amber bottles, (1) 250cc plasbic bottle Purge N Bailer Technique: Pump Sounder Interface Meter Water Meter Water & Free Product Levels Time Depth to Water Depth to Product Notes: 10:35 4.40 Shoon 10:42 4.40 1556 Field Measurements Total Vol. Time Cond./(ms/cm) DO/(%) pΗ Temp/(F) DO/(mg/L) Removed/(gal) 10:46 0 7.16 58.55 .121 3.94 38.9 .142 10:53 58.75 2.87 28.4 7.00 58.84 10:58 2.47 .135 11:04 59.59 21.8 .127 IS Gaires